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Four new species of the planthopper genus *Andes* (Hemiptera, Auchenorrhyncha, Cixiidae) from China, with an updated key to species

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Abstract

Four new species of the genus *Andes* Stål, 1866 (Hemiptera, Auchenorrhyncha, Fulgoromorpha, Cixiidae, Cixiinae, Andini) are described from China: *A. cuneatus* Lv, Zhi & Chen, **sp. nov.**, *A. luchunensis* Lv, Zhi & Chen, **sp. nov.**, *A. scalpratus* Lv, Zhi & Chen, **sp. nov.** from Yunnan Province, and *A. orbiculatus* Lv, Zhi & Chen, **sp. nov.** from Fujian Province. Detailed morphological descriptions, illustrations including female terminalia, and diagnostic comparisons are provided for all new species, with a particular emphasis on the male genital structures that distinguish them from congeners. An updated identification key to all known Chinese species of *Andes* is also presented.

Key Words

Cixiids, Delphacoidea, identification key, Oriental region, planthoppers, taxonomy

Introduction

The tribe Andini (Hemiptera, Auchenorrhyncha, Fulgoromorpha, Cixiidae, Cixiinae) comprises three genera: *Andes* Stål, 1866, *Andixius* Emeljanov & Hayashi, 2007, and *Parandes* Muir, 1925. Among these, *Andes* is a species-rich genus, with 121 described species from the Palaearctic, Oriental, Australian and Afrotropical regions (Bourgoin 2025). Its diagnostic characters are: vertex narrowest and transverse at apex, widening to base, with U- or V-shaped basal emargination; lateral carinae strongly elevated; forewings in resting position steeply tectiform, ScP+RA, RP and MP arising separately from a common point on basal cell or forming a minute common stem; fore coxa with outer margin straight, subparallel with inner margin, not produced (Tsaur et al. 1991; Wang et al. 2022).

13 species, among them five new, occurring in China, were keyed by Wang et al. (2022). Two additional species (*A. hemina* Fennah, 1978 and *A. truncatus* Fennah, 1978) were recorded by Luo et al. (2022). Lv et al. (2025a) transferred *A. hemina* to *Parandes*. The number of species currently known to occur in China is therefore 14 (Bourgoin 2025; Lv et al. 2025a). Four new species (*A. cuneatus* Lv, Zhi & Chen, sp. nov., *A. luchunensis* Lv, Zhi & Chen, sp. nov., *A. orbiculatus* Lv, Zhi & Chen, sp. nov., and *A. scalpratus* Lv, Zhi & Chen, sp. nov.) from southern China are described in this paper, increasing the number of species known from the country to 18.

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Material and methods

Specimens included in the present study were collected in Yunnan and Fujian Provinces of China by sweeping net. All the type specimens are deposited in the Institute of Entomology, Guizhou University, Guiyang, Guizhou Province, China (IEGU).

Dry specimens were used for the descriptions and illustrations. Body length measurements are from the apex of vertex to tip of forewing; vertex length (median length of vertex) was measured from the apical transverse carina to the tip of basal emargination. All measurements are in millimeters (mm). The genital segments were removed and macerated in 10% NaOH, washed in water and transferred to glycerol. Color pictures for adult habitus were obtained using the KEYENCE VHX-6000 and VHX-1000 systems. External morphology and drawings were done under a Leica MZ 12.5 stereomicroscope.

Morphological terminology follows: Bourgoin (1987) for male genitalia, Bourgoin (1993) and Chen and Zhi (2023) for female genitalia, and Bourgoin et al. (2015) for wing venation.

Taxonomy

Genus *Andes* Stål, 1866

Andes Stål, 1866: 166. Type species by subsequent monotypy: *Andes undulatus* Stål, 1870.

Leirioessa Kirkaldy, 1907: 112. Type species by original designation: *Leirioessa tortricomorpha* Kirkaldy, 1907. Synonymized by Muir (1925: 201).

Andes: Muir 1925: 201; Zhou et al. 1985: 23; Tsaur et al. 1991: 67; Löcker et al. 2007: 45; Wang et al. 2022: 46.

Diagnosis. For the diagnosis of *Andes* see Wang et al. (2022: 47).

Distribution. Palaearctic, Oriental, Australian and Afrotropical Regions.

Key to males of species of *Andes* Stål, 1866 occurring in China

Modified from Wang et al. 2022.

1 Forewing with two eye-like spots of different sizes (Tsaur et al. 1991: fig. 36a) ..... *A. luzonensis* Tsaur & Hsu, 1991
– Forewing without such markings 2
2 Frons and lateral margin of vertex with alternating transverse stripes 3
– Frons and lateral margin of vertex without alternating transverse stripes 5
3 Forewing with clavus smoky brown at base; tegminal apex near apical angle distinctly dark brown (Ishihara 1957: fig. 1t) ..... *A. marmoratus* (Uhler, 1896)
– Forewing without above spots 4
4 Medioventral process of pygofer triangular; periandrium with a long, strongly sinuate spine, directed cephalad (Fennah 1956: fig. 1h) ..... *A. noctua* Fennah, 1956
– Medioventral process of pygofer semicircular; periandrium with a long, slender, C-shaped spine, directed ventrad (Tsaur et al. 1991: fig. 34g–i) ..... *A. formosanus* (Matsumura, 1914)
5 Periandrium with a long, slender, S-shaped spine with its tip directed dorsad (Tsaur et al. 1991:fig. 35h–i) ..... *A. notatus* Tsaur & Hsu, 1991
– Periandrium without such a spine 6
6 Medioventral process of pygofer at base with a short spine on each side (Fennah 1956: fig. 1C) ... *A. unicinatus* Fennah, 1956
– Medioventral process of pygofer without spine 7
7 Apical margin of gonostyli deeply emarginate, forming two processes (Wang et al. 2022: fig. 3G, I) ..... *A. bifidus* Wang, Zhi & Chen, 2022
– Gonostyli not forming two processes 8
8 Periandrium on left laterally with a sclerotized, belt-shaped process arising ventrally near apex (Wang et al. 2022: fig. 1J–M) ..... *A. balteiformis* Wang, Zhi & Chen, 2022
– Periandrium without a belt-shaped process 9
9 Anal segment wider than long in dorsal view (Wang et al. 2022: fig. 7H) ..... *A. latanalus* Wang & Chen, 2022
– Anal segment longer than wide in dorsal view 10
10 Ventral margin of periandrium apically with a bifurcated spinose process 11
– Ventral margin of periandrium apically without bifurcated spinose process 12
11 Ventral margin of periandrium apically with a bifurcated spinose process (Wang et al. 2022: fig. 9J–M) ..... *A. pallidus* Wang & Chen, 2022
– Ventral margin of periandrium apically with two bifurcated spinose processes (Fig. 3J–M) ..... *A. luchunensis* Lv, Zhi & Chen, sp. nov.
12 Periandrium with wedge-shaped process apically, dorsal margin with fishtail process (Fig. 1J–M) ..... *A. cuneatus* Lv, Zhi & Chen, sp. nov.
– Periandrium without wedge-shaped process apically, dorsal margin without fishtail process 13

13 Gonostyli truncate at apex in ventral view (Fennah 1978: fig. 5)..... *A. truncatus* Fennah, 1978
– Gonostyli not truncate at apex in ventral view..... 14
14 Endosoma with process bearing small teeth 15
– Endosoma with process not bearing small teeth 17
15 Ventral margin of periandrium with a circular lamellar process at proximal part (Fig. 5J–M).....
.....*A. orbiculatus* Lv, Zhi & Chen, sp. nov.
– Ventral margin of periandrium without a circular lamellar process at proximal part 16
16 Endosoma with two processes at apical part, gonostyli not knife-shaped in lateral view (Wang et al. 2022: fig. 5I, J–M)
.....*A. furcutus* Wang, Zhang & Chen, 2022
– Endosoma without two processes at apical part, gonostyli knife-shaped in lateral view (Fig. 7I, J–M) .....
.....*A. scalpratus* Lv, Zhi & Chen, sp. nov.
17 Endosoma of aedeagus basally with two spinose processes (Fennah 1956: fig. 1e) .....*A. othrepte* Fennah, 1956
– Endosoma of aedeagus basally without spinose processes, coarsely shagreen or sub-fimbriate (Fennah 1956: fig. 2m)
..... *A. lachesis* Fennah, 1956

Andes cuneatus Lv, Zhi & Chen, sp. nov.

https://zoobank.org/F6D5D99C-1D7D-4877-A851-9511A03707E3

Figs 1, 2

Type materials. ***Holotype*:** CHINA • ♂: 'Yunnan Province, Mengla County, Mohan Town; 21°11'N, 101°41'E; sweeping, 11 August 2023; Sha-Sha Lv leg.'; IEGU. ***Paratypes*:** CHINA • '1 ♂ 3 ♀♀; Yunnan Province, Mengla County, Mohan Town; 21°11'N, 101°41'E; sweeping, 11 August 2023; Sha-Sha Lv and Feng-E Li leg.'; IEGU. '2 ♂♂ 1 ♀; Yunnan Province, Gaoligongshan National Nature Reserve; 25°30'N, 98°79'E; sweeping, 28 August 2023; Yong-Jin Sui and Feng-E Li leg.'; IEGU.

Diagnosis. Diagnostic characters of the new species include: general color (Fig. 1A, B) dark brown; vertex (Fig. 1A, C) about 0.81 times as long as wide; anal segment (Fig. 1F, H) with right lobe larger than left lobe; periandrium (Fig. 1J–M) with two spinose processes at basal 1/4, dorsal margin with a thick process, apical part bifurcated, fishtail, apical part with a lamellar wedge-shaped process; endosoma short, without spinose process.

Description. ***Measurements.*** Total length: male 6.2–6.8 mm ($N = 4$), female 6.8–7.3 mm ($N = 4$).

Coloration. General color (Fig. 1A, B) dark brown. Vertex and frons brown. Eyes (Fig. 1A–D) blackish brown. Ocelli (Fig. 1B, D) red with faint yellow, semi-translucent. Clypeus (Fig. 1D) yellowish brown. Pronotum (Fig. 1A, C) light yellowish brown to blackish brown. Mesonotum (Fig. 1A, C) yellowish brown to brown. Tegulae (Fig. 1A, C) yellowish brown. Forewings (Fig. 1E) semi-translucent, dark brown, with light grayish-brown spots, pterostigma yellowish brown, veins and tubercles yellowish brown to dark brown, as shown in Fig. 1E. Hind legs yellowish brown. Abdomen dark brown ventrally.

Head and thorax. Vertex (Fig. 1A, C) about 0.81 times as long as wide, width at apex narrower than at base (about 1:2.15), anterior margin V-shaped, posterior margin concave, lateral carina strongly developed, median carina absent. Frons (Fig. 1D) longer in middle line than wide at widest portion (about 3.05:1). Pronotum (Fig. 1A, C) shorter than vertex in midline (about 1:2.8), posterior margin forming a right angle. Mesonotum (Fig. 1A, C) about 2.19 times longer than pronotum and vertex combined. Forewings (Fig. 1E) about 2.06 times as long as wide, with thirteen apical cells and seven subapical cells, RP 4 branches, MP with 5 terminals: MP_{11}, MP_{12}, MP_2, MP_3, and MP_4, fork MP_1+MP_2 basad of fork MP_3+MP_4. Hind tibiae with five lateral spines. Metatibiotarsal formula 8/8, second segment of hind tarsus with three platellae.

Male terminalia. Pygofer (Fig. 1F, G) in ventral view symmetrical; in lateral view lateral lobes trapezoid-shaped, posterior margin with middle part distinctly convex. Medioventral process linguiform in ventral view, apical margin rounded. Anal segment (Fig. 1F, H) flat, tubular, right lobe larger than left lobe, about 1.81 times as long as wide in dorsal view; anal style small, not extending beyond anal segment. Gonostyli (Fig. 1G, I) symmetrical ventrally, inner margin with two small processes at basal 1/3; in lateral view dorsal and ventral margins curved, apical half slightly widen. Aedeagus (Fig. 1J–M) with seven processes. Basal 1/4 of periandrium with two spinose processes on left side, basal one longer than dorsal one, both parallel, directed ventrocaudad; dorsal margin with a thick process, apical part bifurcated, fishtail; middle part with a lamellar process, dorsal margin serrated, dorsocephalad; apical 1/3 with a medium-length spinose process, directed ventrocephalad; apical part with a lamellar wedge-shaped process, directed dorsocaudad. Endosoma short, without spinose process.

Female terminalia. Tergite IX (Fig. 2A, B, D) moderately sclerotized, with a large, nearly elliptical wax plate. Anal segment (Fig. 2C) nearly rectangular, about 1.8 times as long as wide in dorsal view, anal style linguiform. Gonapophysis VIII (Fig. 2E) elongate and slightly curved upwards. Gonapophysis IX (Fig. 2F) with two middle teeth, distance ratio between first middle tooth to apex and length of denticulate portion about 2.25. Gonoplac (Fig. 2G) rod-like, about 4.2 times as long as wide in lateral view. Posterior vagina pattern as shown in Fig. 2H.

Distribution. China (Yunnan Province).

Etymology. The species name is the Latin adjective *cuneatus*, *-a*, *-um*, meaning "wedge-shaped", referring to the periandrium provided with a wedge-shaped process at its apical part.

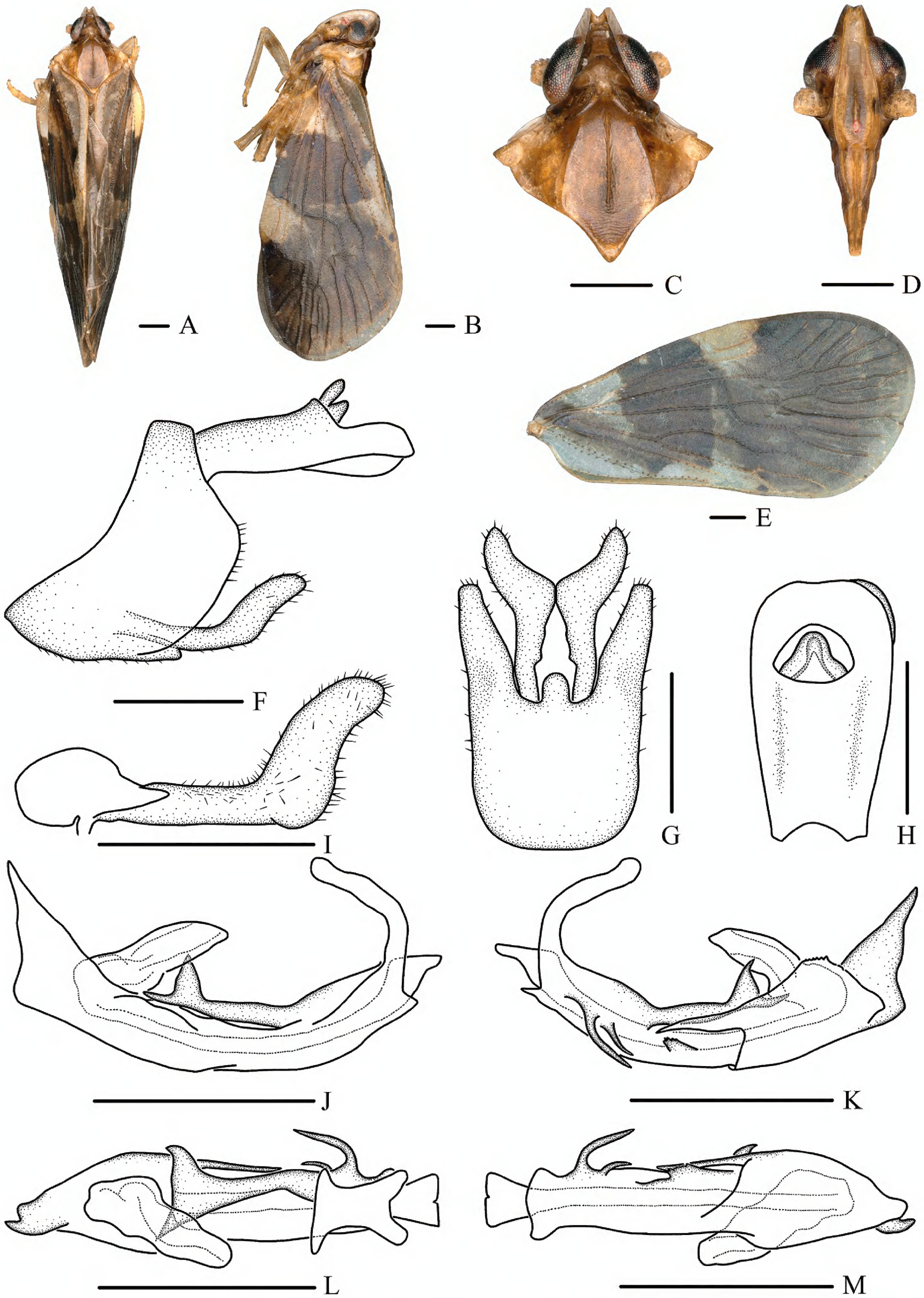

Figure 1. *Andes cuneatus* Lv, Zhi & Chen, sp. nov., male. **A.** Habitus, dorsal view; **B.** Habitus, lateral view; **C.** Head and thorax, dorsal view; **D.** Frons, ventral view; **E.** Forewing; **F.** Genitalia, lateral view; **G.** Pygofer and gonostyli, ventral view; **H.** Anal segment, dorsal view; **I.** Gonostyli, lateral view; **J.** Aedeagus, right side; **K.** Aedeagus, left side; **L.** Aedeagus, dorsal view; **M.** Aedeagus, ventral view. Scale bars: 0.5 mm (**A–M**).

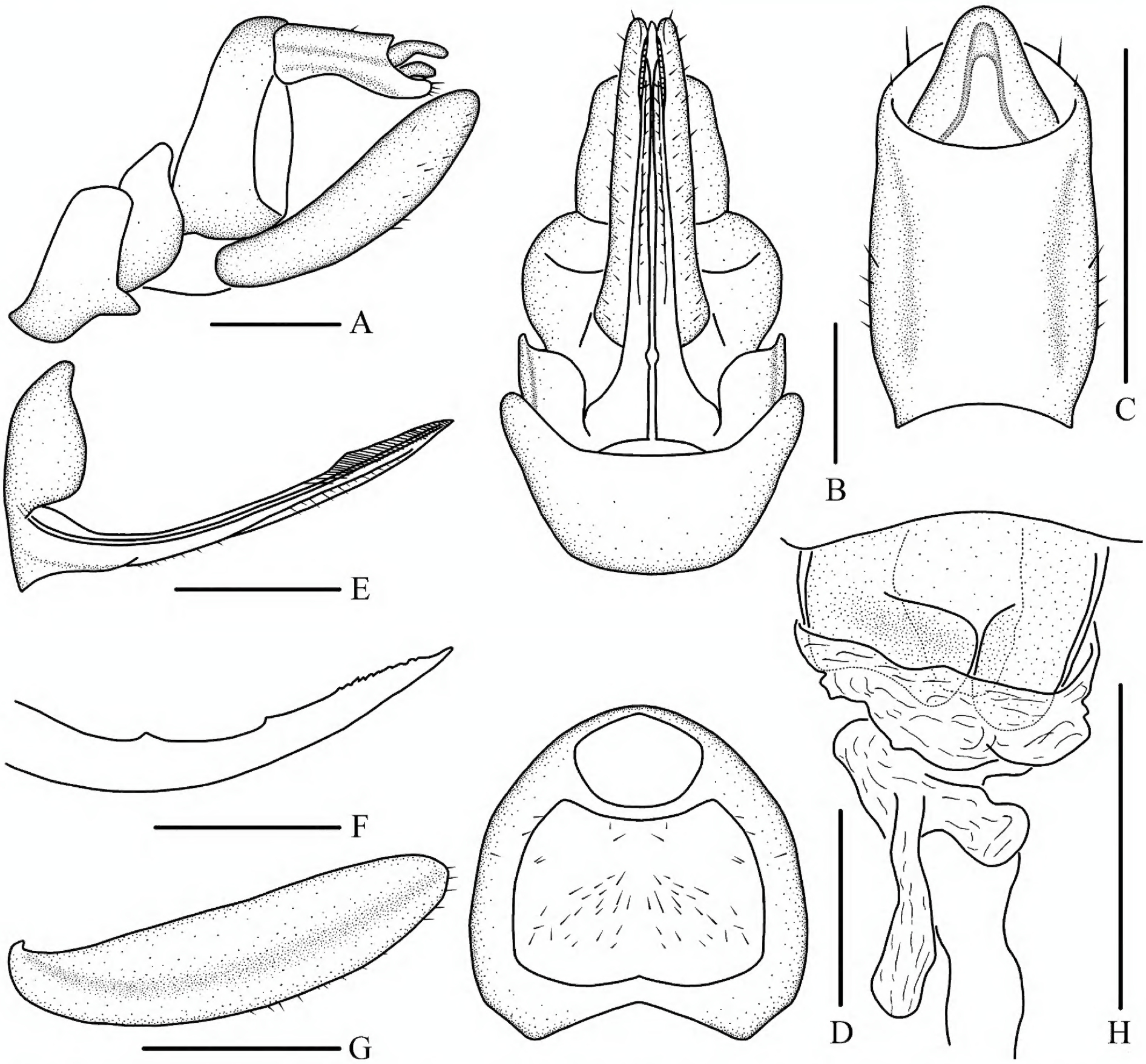

Figure 2. *Andes cuneatus* Lv, Zhi & Chen, sp. nov., female. **A.** Genitalia, lateral view; **B.** Genitalia, ventral view; **C.** Anal segment, dorsal view; **D.** Tergite IX, caudal view; **E.** Gonapophysis VIII and gonocoxa VIII, dorsal view; **F.** Gonapophysis IX, lateral view; **G.** Gonoplac, inner lateral view; **H.** Posterior vagina, ventral view. Scale bars: 0.5 mm (**A–H**).

Remarks. This species is similar to *A. truncatus* Fennah, 1978, but differs from the latter species in: (1) vertex being wider than long (as long as wide in *A. truncatus*); (2) gonostyli not truncate at apex in ventral view (truncate at apex in ventral view in *A. truncatus*); and (3) periandrium with a wedge-shaped process apically, dorsal margin with fishtail-like process (without wedge-shaped process apically, dorsal margin without fishtail-like process at apex in *A. truncatus*).

Andes luchunensis Lv, Zhi & Chen, sp. nov.

https://zoobank.org/5902A430-00B2-42AF-82A6-EB7774EA0D57

Figs 3, 4, 9

Type materials. ***Holotype*:** CHINA • ‘♂: Yunnan Province, Lüchun County, Huanglianshan National Nature Reserve; 22°85'N, 102°20'E; sweeping, 4 August 2023; Sha-Sha Lv leg.’; IEGU. ***Paratypes*:** CHINA • ‘8 ♂♂ 7 ♀♀; Yunnan Province, Lüchun County, Huanglianshan National Nature Reserve; 22°85'N, 102°20'E; sweeping, 4 August 2023; Sha-Sha Lv, Yong-Jin Sui and Feng-E Li leg.’; IEGU.

Diagnosis. Diagnostic characters of the new species include: basal half of forewings (Fig. 3E) with claw-shaped marking; vertex (Fig. 3A, C) as long as wide; apical 2/5 to 4/5 of gonostyli (Fig. 3G, I) widened; ventral margin of periandrium apically with two bifurcated spinose processes, apical part with a triangular process on right side.

Description. ***Measurements*.** Total length: male 7.2–7.5 mm ($N = 9$), female 7.5–8.6 mm ($N = 7$).

***Coloration*.** General color (Fig. 3A, B) yellowish brown. Vertex (Fig. 3A, C) dark brown. Eyes (Fig. 3A–D) brownish-gray with red. Ocelli (Fig. 3B, D) light yellow with reddish, semi-translucent. Frons (Fig. 3D)

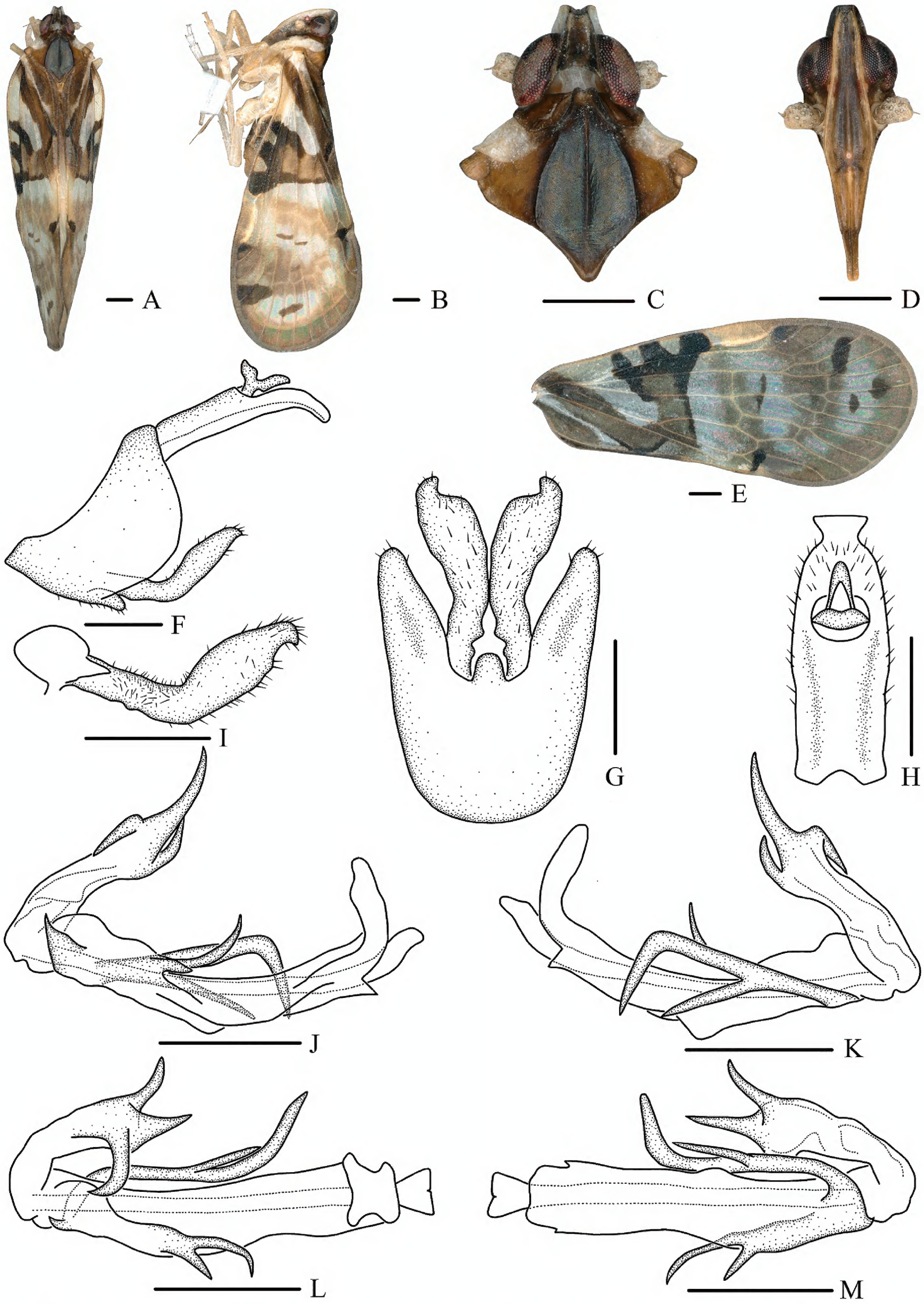

Figure 3. *Andes luchunensis* Lv, Zhi & Chen, sp. nov., male. **A.** Habitus, dorsal view; **B.** Habitus, lateral view; **C.** Head and thorax, dorsal view; **D.** Frons, ventral view; **E.** Forewing; **F.** Genitalia, lateral view; **G.** Pygofer and gonostyli, ventral view; **H.** Anal segment, dorsal view; **I.** Gonostyli, lateral view; **J.** Aedeagus, right side; **K.** Aedeagus, left side; **L.** Aedeagus, dorsal view; **M.** Aedeagus, ventral view. Scale bars: 0.5 mm (**A–M**).

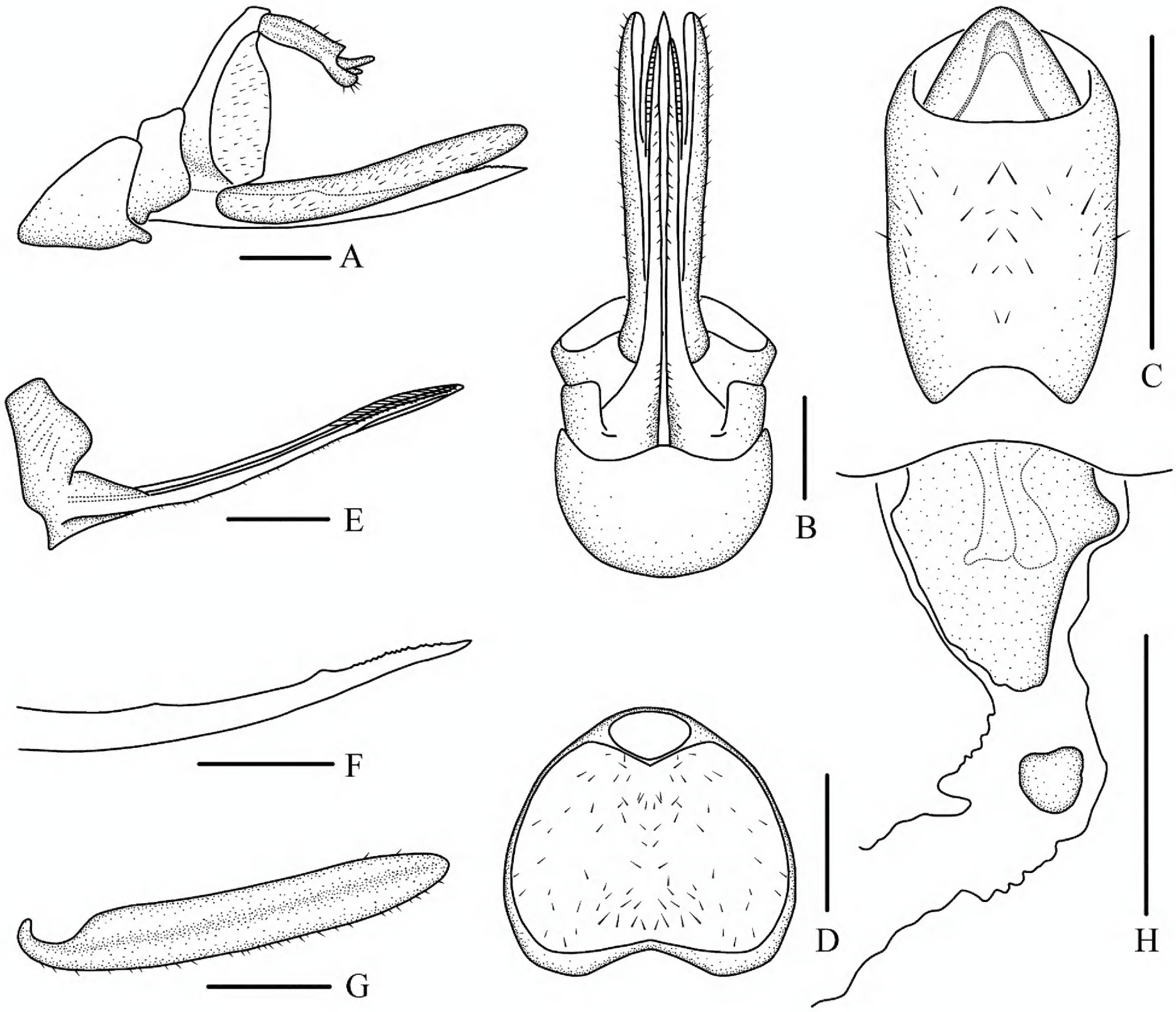

Figure 4. *Andes luchunensis* Lv, Zhi & Chen, sp. nov., female. **A.** Genitalia, lateral view; **B.** Genitalia, ventral view; **C.** Anal segment, dorsal view; **D.** Tergite IX, caudal view; **E.** Gonapophysis VIII and gonocoxa VIII, dorsal view; **F.** Gonapophysis IX, lateral view; **G.** Gonoplac, inner lateral view; **H.** Posterior vagina, ventral view. Scale bars: 0.5 mm (**A–H**).

blackish-brown at middle part, lateral parts yellowish-brown. Postclypeus (Fig. 3D) yellowish brown, anteclypeus brown. Pronotum (Fig. 3A, C) dark brown at upper part, rest light grayish yellow. Mesonotum (Fig. 3A, C) dark brown between two lateral carinae, rest yellowish brown. Tegulae (Fig. 3A, C) yellowish brown. Forewings (Fig. 3E) semi-translucent, with many light yellowish brown to dark brown spots, basal half with claw-shaped marking, with pterostigma yellowish brown, veins and tubercles yellowish brown to dark brown, as shown in Fig. 3E. Hind legs yellowish brown. Abdomen yellowish brown to dark brown ventrally.

Head and thorax. Vertex (Fig. 3A, C) with length and width approximately equal, width at apex narrower than at base (about 1:2.15), anterior margin arc-shaped, posterior margin V-shaped, lateral carina strongly developed, median carina absent. Frons (Fig. 3D) longer in middle line than wide at widest portion (about 3.16:1). Pronotum (Fig. 3A, C) shorter than vertex in midline (about 1:2.86), posterior margin forming a right angle. Mesonotum (Fig. 3A, C) about 1.84 times longer than pronotum and vertex combined. Forewings (Fig. 3E) about 2.29 times as long as wide, with twelve apical cells and seven subapical cells, RP 3 branches, MP with 5 terminals: MP_{11}, MP_{12}, MP_2, MP_3, and MP_4, fork MP_1+MP_2 basad of fork MP_3+MP_4. Hind tibiae with four lateral spines. Metatibiotarsal formula 8/8, second segment of hind tarsus with three platellae.

Male terminalia. Pygofer (Fig. 3F, G) in ventral view symmetrical; in lateral view lateral lobes arcuate and extended caudally. Medioventral process nearly cylindrical in ventral view, apical margin rounded. Anal segment (Fig. 3F, H) flat, tubular, in lateral view, dorsal margin nearly straight, apical part expanded ventrally; about 2.74 times as long as wide in dorsal view; anal style fingerlike, not extending beyond anal segment. Gonostyli (Fig. 3G, I) symmetrical ventrally, inner margin with two small protrusions at basal 1/3, apical 2/5 to 4/5 widen; in lateral

view dorsal margins V-shaped, apical half to 4/5 slightly widen. Aedeagus (Fig. 3J–M) with eight processes. Ventral margin of periandrium with a bifurcated process at apical part, dorsal one long, bend at the middle, directed ventrad, ventral one straight, directed ventrocephalad; on right side, apical part with a triangular process, directed dorsocaudad; middle part with a bifurcated process, longer one curved, directed dorsocephalad, shorter one directed ventrocephalad. Endosoma bent dorsally, apical part with three spinose processes, middle one longest, arc bent, directed dorsocephalad, the remaining two processes of approximately the same length, opposite direction.

Female terminalia. Tergite IX (Fig. 4A, B, D) moderately sclerotized, with a large, nearly elliptical wax plate. Anal segment (Fig. 4C) nearly rectangular, about 1.74 times as long as wide in dorsal view, anal style linguiform. Gonapophysis VIII (Fig. 4E) elongate and slightly curved upwards. Gonapophysis IX (Fig. 4F) with two middle teeth, distance ratio between first middle tooth to apex and length of denticulate portion about 1.66. Gonoplac (Fig. 4G) rod-like, about 7.13 times as long as wide in lateral view. Posterior vagina pattern as shown in Fig. 4H.

Distribution. China (Yunnan Province).

Etymology. The new species is named after its type locality which is located in Lüchun County, Yunnan Province.

Remarks. This species is similar to *A. pallidus* Wang & Chen, 2022, but differs from the latter species in: (1) general color yellowish brown (yellowish white in *A. pallidus*); (2) ventral margin of periandrium apically with two bifurcated spinose processes (with one bifurcated spinose process in *A. pallidus*); and (3) apical part of endosoma with three spinose processes (with one spinose process in *A. pallidus*).

Andes orbiculatus Lv, Zhi & Chen, sp. nov.

https://zoobank.org/167FA940-CF80-45A9-B884-E50894B3098F

Figs 5, 6

Type materials. ***Holotype*:** CHINA • ‘♂: Fujian Province, Wanmulin Provincial Nature Reserve; 27°05'N, 118°15'E; sweeping, 20 May 2012; Zhi-Min Chang leg.’; IEGU. ***Paratypes*:** CHINA • ‘6 ♂♂ 7 ♀♀; Fujian Province, Wanmulin Provincial Nature Reserve; 27°05'N, 118°15'E; sweeping, 20 May 2012; Zhi-Min Chang, Wei-Cheng Yang and Jian-Kun Long leg.’; IEGU.

Diagnosis. Diagnostic characters of the new species include: basal half of forewings (Fig. 5E) with yellowish brown wide markings and three dark brown spots; medioventral process (Fig. 5G) lanceolate in ventral view; left lobe of anal segment (Fig. 5F, G) extends extremely downward at apical part, significantly larger than right lobe; ventral margin of periandrium (Fig. 5J–M) extends a circular lamellar process at proximal part.

Description. ***Measurements.*** Total length: male 5.7–6.3 mm ($N = 7$), female 6.2–6.6 mm ($N = 7$).

Coloration. General color (Fig. 5A, B) yellowish brown. Vertex (Fig. 5A, C) dark brown. Eyes (Fig. 5A–D) grayish brown. Ocelli (Fig. 5B, D) bright yellowish-brown, semi-translucent. Frons (Fig. 5D) blackish-brown. Clypeus (Fig. 5D) yellowish brown. Pronotum (Fig. 5A, C) dark brown at upper part, rest grayish brown. Mesonotum (Fig. 5A, C) brown between two lateral carinae, rest rusty. Tegulae (Fig. 5A, C) yellowish brown. Forewings (Fig. 5E) semi-translucent, basal half with yellowish brown wide markings and three dark brown spots, apical half with large area dark brown markings, pterostigma yellowish brown, veins and tubercles yellowish brown to dark brown, as shown in Fig. 5E. Hind tibiae yellowish brown. Abdomen dark brown ventrally.

Head and thorax. Vertex (Fig. 5A, C) about 0.84 times as long as wide, width at apex narrower than at base (about 1:1.91), anterior margin arc-shaped, posterior margin V-shaped, lateral carina strongly developed, median carina absent. Frons (Fig. 5D) longer in middle line than wide at widest portion (about 2.93:1). Pronotum (Fig. 5A, C) shorter than vertex in midline (about 1:1.95), posterior margin forming a right angle. Mesonotum (Fig. 5A, C) about 2.12 times longer than pronotum and vertex combined. Forewings (Fig. 5E) about 2.21 times as long as wide, with twelve apical cells and seven subapical cells, RP 3 branches, MP with 5 terminals: MP_{11}, MP_{12}, MP_2, MP_3, and MP_4, fork MP_1+MP_2 basad of fork MP_3+MP_4. Hind tibiae with four lateral spines. Metatibiotarsal formula 8/8, second segment of hind tarsus with three platellae.

Male terminalia. Pygofer (Fig. 5F, G) in ventral view symmetrical, U-shaped; in lateral view lateral lobes arcuate and extended caudally. Medioventral process lanceolate in ventral view. Anal segment (Fig. 5F, H) flat, tubular, in lateral view, dorsal margin nearly straight, left lobe extends extremely downward at apical part, significantly larger than right lobe; about 1.58 times as long as wide in dorsal view; anal style fingerlike, not extending beyond anal segment. Gonostyli (Fig. 5G, I) symmetrical ventrally, inner margin with two small serrate protrusions at base; in lateral view dorsal margins arc-shaped, apical part slightly expanded. Aedeagus (Fig. 5J–M) with six processes. Ventral margin of periandrium with a lamellar process ventrad near the base, apical part forming a spinose process, directed dorsocaudad, extends a circular lamellar process at proximal part; on right side, apical part with a large lamellar process, with small teeth along the margin; dorsal margin with a slender process at apical part, curved, directed ventrocephalad. Endosoma broad, apical half with three branches, left one rod-shaped, densely covered with small teeth, other two lamellar, right one long, margin with several small teeth.

Female terminalia. Tergite IX (Fig. 6A, B, D) moderately sclerotized, with a large, nearly elliptical wax plate. Anal segment (Fig. 6C) nearly rectangular, about 1.55 times as long as wide in dorsal view, anal style linguiform. Gonapophysis VIII (Fig. 6E) elongate and slightly curved upwards. Gonapophysis IX (Fig. 6F)

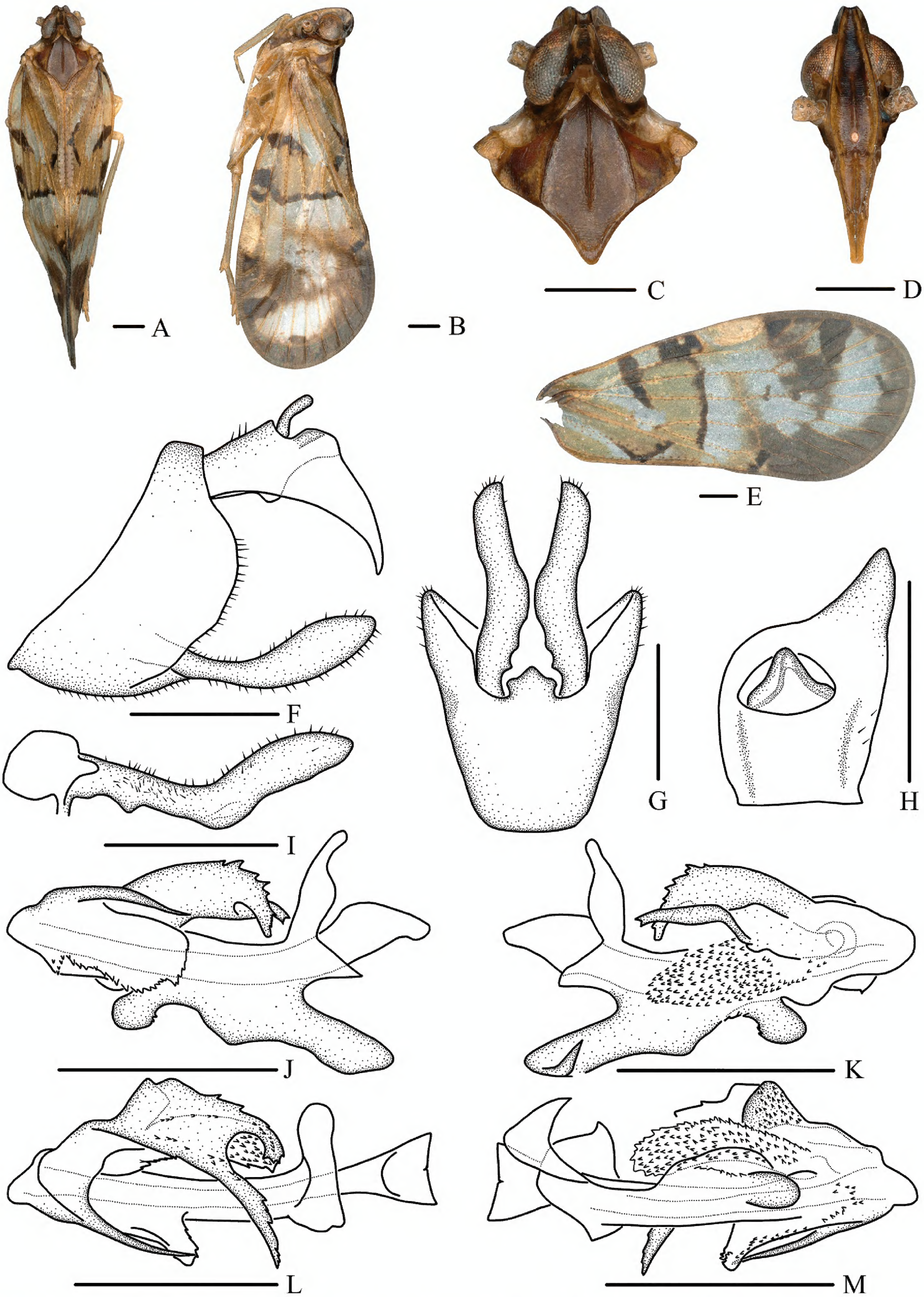

Figure 5. *Andes orbiculatus* Lv, Zhi & Chen, sp. nov., male. **A.** Habitus, dorsal view; **B.** Habitus, lateral view; **C.** Head and thorax, dorsal view; **D.** Frons, ventral view; **E.** Forewing; **F.** Genitalia, lateral view; **G.** Pygofer and gonostyli, ventral view; **H.** Anal segment, dorsal view; **I.** Gonostyli, lateral view; **J.** Aedeagus, right side; **K.** Aedeagus, left side; **L.** Aedeagus, dorsal view; **M.** Aedeagus, ventral view. Scale bars: 0.5 mm (**A–M**).

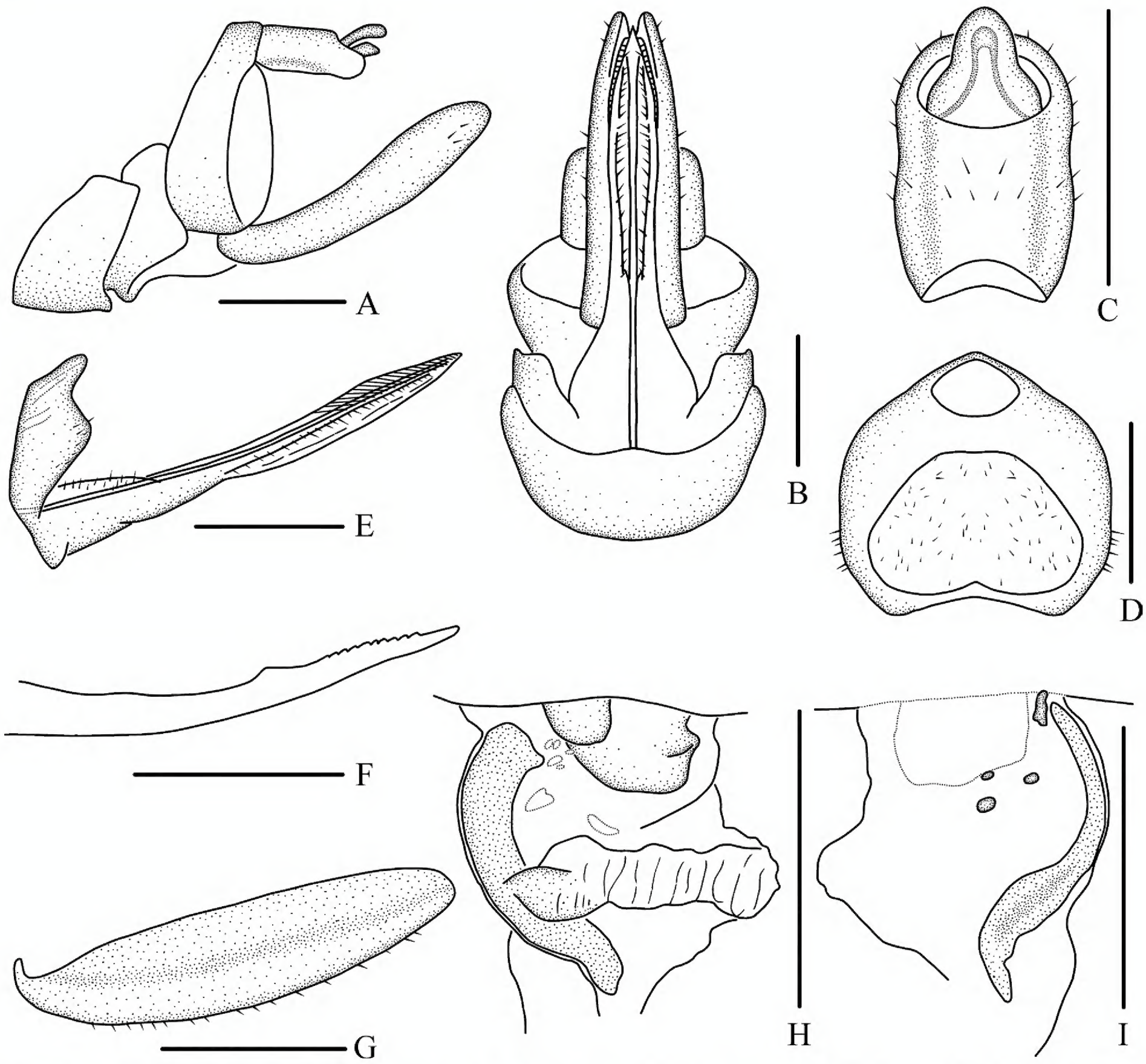

Figure 6. *Andes orbiculatus* Lv, Zhi & Chen, sp. nov., female. **A.** Genitalia, lateral view; **B.** Genitalia, ventral view; **C.** Anal segment, dorsal view; **D.** Tergite IX, caudal view; **E.** Gonapophysis VIII and gonocoxa VIII, dorsal view; **F.** Gonapophysis IX, lateral view; **G.** Gonoplac, inner lateral view; **H.** Posterior vagina, ventral view; **I.** Posterior vagina, dorsal view. Scale bars: 0.5 mm (**A–I**).

with one middle tooth, distance ratio between first middle tooth to apex and length of denticulate portion about 2.07. Gonoplac (Fig. 6G) rod-like, about 4.34 times as long as wide in lateral view. Posterior vagina pattern as shown in Fig. 6H, I.

Distribution. China (Fujian Province).

Etymology. The species name is the Latin adjective *orbiculatus*, *-a*, *-um*, meaning "rounded, circular", referring to the ventral margin of periandrium extending a circular lamellar process at proximal part.

Remarks. This species is similar to *A. truncatus* Fennah, 1978, but differs from the latter species in: (1) medioventral process being lanceolate in ventral view (angulate in ventral view in *A. truncatus*); (2) anal tube bilaterally asymmetrical (bilaterally symmetrical in *A. truncatus*); and (3) gonostyli not truncate at apex in ventral view (truncate at apex in ventral view in *A. truncatus*).

Andes scalpratus Lv, Zhi & Chen, sp. nov.

https://zoobank.org/537C3D9F-4C64-47C2-9035-672C972B4B44

Figs 7, 8

Type materials. ***Holotype*:** CHINA • '♂: Yunnan Province, Xichou County, Fadou Township; 23°38'N, 104°79'E; sweeping, 17 August 2023; Yong-Jin Sui leg.'; IEGU. ***Paratypes*:** CHINA • '6 ♂♂ 3 ♀♀; Yunnan Province, Xichou County, Fadou Township; 23°38'N, 104°79'E; sweeping, 17 August 2023; Min Tang, Feng-E Li and Yong-Jin Sui leg.'; IEGU.

Diagnosis. Diagnostic characters of the new species include: medioventral process (Fig. 7G) arc-shaped in ventral view; apical part of gonostyli (Fig. 7G, I) knife-shaped in lateral view; aedeagus (Fig. 7J–M) with three processes; apical 1/4 of endosoma (Fig. 7J–M) densely covered with small teeth.

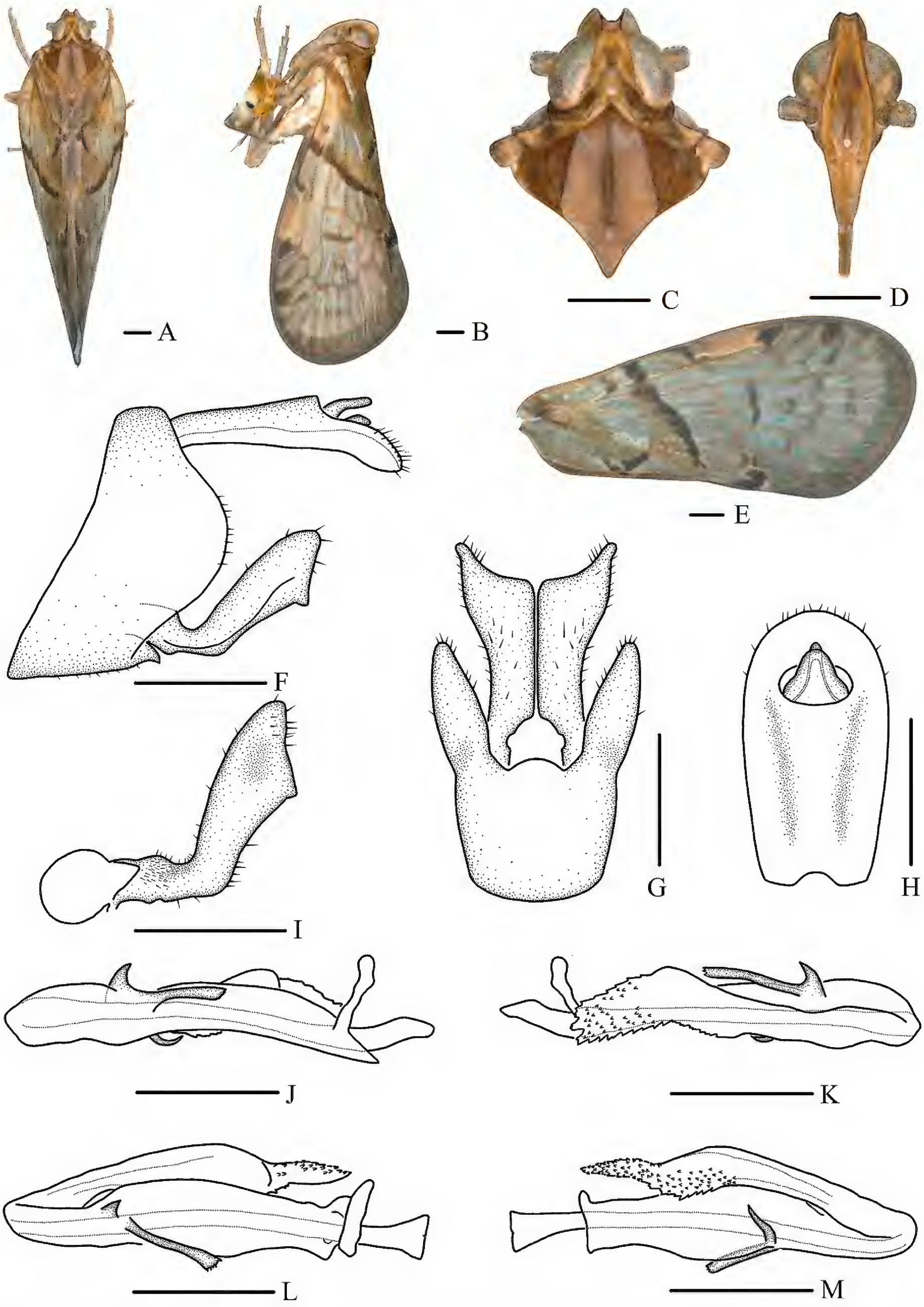

Figure 7. *Andes scalpratus* Lv, Zhi & Chen, sp. nov., male. **A.** Habitus, dorsal view; **B.** Habitus, lateral view; **C.** Head and thorax, dorsal view; **D.** Frons, ventral view; **E.** Forewing; **F.** Genitalia, lateral view; **G.** Pygofer and gonostyli, ventral view; **H.** Anal segment, dorsal view; **I.** Gonostyli, lateral view; **J.** Aedeagus, right side; **K.** Aedeagus, left side; **L.** Aedeagus, dorsal view; **M.** Aedeagus, ventral view. Scale bars: 0.5 mm (**A–M**).

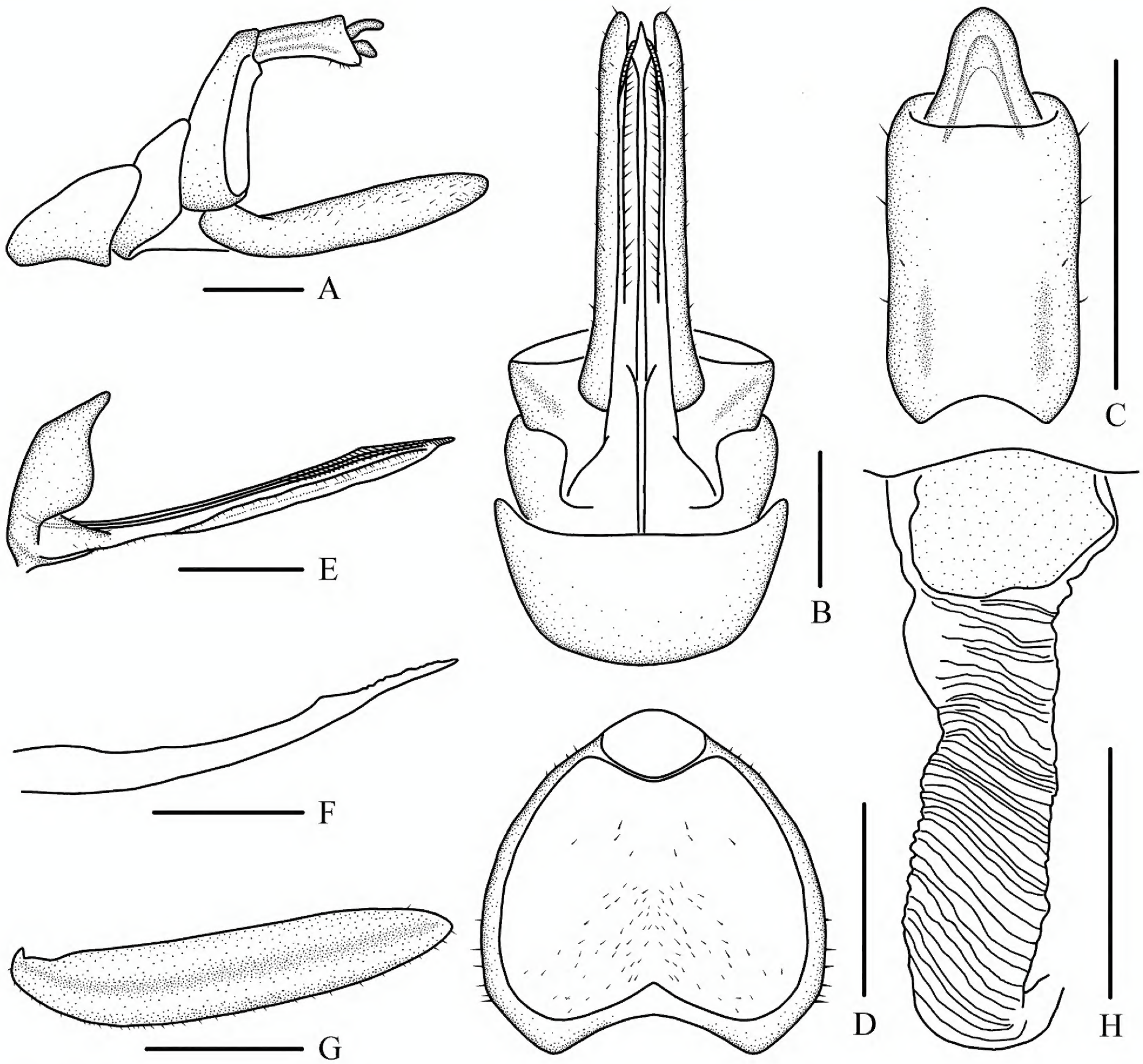

Figure 8. *Andes scalpratus* Lv, Zhi & Chen, sp. nov., female. **A.** Genitalia, lateral view; **B.** Genitalia, ventral view; **C.** Anal segment, dorsal view; **D.** Tergite IX, caudal view; **E.** Gonapophysis VIII and gonocoxa VIII, dorsal view; **F.** Gonapophysis IX, lateral view; **G.** Gonoplac, inner lateral view; **H.** Posterior vagina, ventral view. Scale bars: 0.5 mm (**A–H**).

Description. ***Measurements.*** Total length: male 6.7–7.3 mm ($N = 7$), female 7.8–7.9 mm ($N = 3$).

Coloration. General color (Fig. 7A, B) yellowish brown. Vertex (Fig. 7A, C) brown. Eyes (Fig. 7A–D) grayish brown. Ocelli (Fig. 7B, D) bright yellowish-brown with red, semi-translucent. Frons (Fig. 7D) blackish-brown. Clypeus (Fig. 7D) brown. Pronotum (Fig. 7A, C) yellowish brown. Mesonotum (Fig. 7A, C) brown. Tegulae (Fig. 7A, C) yellowish brown. Forewings (Fig. 7E) semi-translucent, basal 1/3 with a dark brown diagonal stripe, apical part with a broad brown stripe, rest dotted with several small yellowish brown to dark brown spots, pterostigma yellowish brown, veins and tubercles yellowish brown, as shown in Fig. 7E. Hind legs brown. Abdomen dark brown ventrally.

Head and thorax. Vertex (Fig. 7A, C) about 1.29 times as wide as long, width at apex narrower than at base (about 1:2.1), anterior margin arc-shaped, posterior margin V-shaped, lateral carina strongly developed, median carina absent. Frons (Fig. 7D) longer in middle line than wide at widest portion (about 2.6:1). Pronotum (Fig. 7A, C) shorter than vertex in midline (about 1:1.37), posterior margin forming a right angle. Mesonotum (Fig. 7A, C) about 2.43 times longer than pronotum and vertex combined. Forewings (Fig. 7E) about 2.19 times as long as wide, with thirteen apical cells and seven subapical cells, RP 4 branches, MP with 5 terminals: MP_{11}, MP_{12}, MP_2, MP_3, and MP_4, fork MP_1+MP_2 basad of fork MP_3+MP_4. Hind tibiae with four to five lateral spines. Metatibiotarsal formula 7/8, second segment of hind tarsus with three platellae.

Figure 9. Adult of *Andes luchunensis* Lv, Zhi & Chen, sp. nov. resting on the leaf of fern. 4 August 2023, Huanglianshan National Nature Reserve, Lüchun County, Yunnan Province, photographed by Feng-E Li.

Male terminalia. Pygofer (Fig. 7F, G) in ventral view symmetrical, U-shaped, lateral margins slightly concave medially; in lateral view lateral lobes arcuate and extended caudally. Medioventral process arc-shaped in ventral view. Anal segment (Fig. 7F, H) tubular, in lateral view, dorsal and ventral margins nearly straight, extends slightly downward at apical part; about 1.9 times as long as wide in dorsal view; anal style fingerlike, not extending beyond anal segment. Gonostyli (Fig. 7G, I) symmetrical ventrally, inner margin with two small protrusions at base; in lateral view dorsal margins triangularly concave, apical part expanded, knife-shaped. Aedeagus (Fig. 7J–M) with three processes. Periandrium with a striplike process near the middle, apical part with small teeth, directed cephalad; apical 1/4 with horn-shaped process, directed dorsocephalad; ventral margin with a small spinose process, curves to the left, directed dorsocephalad. Endosoma curved, apical 1/4 densely covered with small teeth.

Female terminalia. Tergite IX (Fig. 8A, B, D) moderately sclerotized, with a large, nearly elliptical wax plate. Anal segment (Fig. 8C) nearly rectangular, about 1.71 times as long as wide in dorsal view, anal style linguiform. Gonapophysis VIII (Fig. 8E) elongate and slightly curved upwards. Gonapophysis IX (Fig. 8F) with one middle tooth, distance ratio between first middle tooth to apex and length of denticulate portion about 1.77. Gonoplac (Fig. 8G) rod-like, about 4.93 times as long as wide in lateral view. Posterior vagina pattern as shown in Fig. 8H.

Distribution. China (Yunnan Province).

Etymology. The species name is the Latin adjective *scalpratus*, *-a*, *-um*, meaning "having a sharp edge", referring to the apical part of the gonostyli being knife-shaped in lateral view.

Remarks. This species is similar to *A. furcutus* Wang, Zhang & Chen, 2022, but differs from the latter species in: (1) medioventral process being arc-shaped in ventral view (lanceolate in ventral view in *A. furcutus*); (2) apical part of gonostyli knife-shaped in lateral view (different in *A. furcutus*); and (3) endosoma without two processes at apical part (with two processes at apical part in *A. furcutus*).

Discussion

Cixiidae is the most species-rich lineage within Fulgoromorpha, currently comprising approximately 256 genera and 2,660 species, representing 10.2% and 18.9%, respectively, of global planthopper diversity (Bourgoin 2025). 37 genera and 308 species have been recorded from China (Zhi et al. 2017, 2018a, b, 2019, 2020a, b, c, 2021, 2023; Lv et al. 2024; Luo et al. 2022; Lyu and Webb 2023; Bourgoin 2025; Lyu 2025), representing roughly 14% of generic and 11% of species diversity worldwide, a proportion that is clearly low given the country's diverse geography and extensive subtropical and tropical habitats. Andini is a moderately diverse tribe among the family (142 described species globally), yet by describing four new species in the present paper, the previously reported Chinese fauna is increased by 14% (Wang et al. 2020, 2022, 2023a, b; Lv et al. 2025b). This suggests that Andini may be substantially more species-rich in China than previously suspected.

Host-plant records for Cixiidae currently encompass include 51 plant orders globally (Bertin et al. 2010; Löcker and Holzinger 2019; Luo et al. 2019, 2025; Chen et al. 2024; Chen and Yang 2024; Bourgoin 2025). Wang et al. (2022) hypothesized that species of *Andes* probably feed on dark, damp mosses or ferns. Adults of *Andes luchunensis* sp. nov. were collected on ferns (Fig. 9), suggesting that these plants indeed may serve as the host at least of this species.

Acknowledgements

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